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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/895,511	06/29/2001	Ted Liang	042390P11354	8234

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EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No.	Applicant(s)	
	09/895,511	LIANG ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 18-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 18-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 29, 2004 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 22, 23, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Each claim requires "said electrons". It is uncertain which of the two "electron columns" Applicant refers.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claims 1-12, 18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Casey, Jr. et al (USPat. 6,042,738) as demonstrated by Baum, Aaron Wolf et al (US 5,684,360

A). Casey teaches an apparatus (Figure 1) including:

- i. A holder (26) adapted to mount a substrate (30)
- ii. A stage (24) adapted to position the holder in a chamber (22)
- iii. A pumping system (“vacuum chamber 22”; column 4, lines 31) adapted to evacuate the chamber
- iv. A first electron column¹ (28; Figure 1; column 3, lines 8-16, “image and mill the workpiece”; column 4, lines 5-10; column 5, lines 5-10) imaging system (54; column 4, lines 38-45; column 5, lines 5-10) adapted to locate (column 6, lines 17-30) an opaque defect (abstract; column 1, lines 5-10; column 2, lines 28-50; column 8, line 62 – column 9, line 2;) in the substrate
- v. A gas delivery system (45, 34; column 5, lines 22-38) adapted to dispense a reactant gas towards the defect
- vi. A second electron column¹ delivery system (32; column 4, line 64 – column 5, line 12) adapted to direct electrons towards the opaque defect (column 3, lines 60-65)
- vii. DUV/EUV mask substrate (column 1, lines 35-45)
- viii. Chrome opaque defect (column 3, lines 3-4; line 55)
- ix. An ion focusing system (18; column 4, lines 28-44) and scanning system (62, column 4, lines 39-43)

¹ Baum, Aaron Wolf et al (US 5,684,360 A) teaches the art-accepted definition of “electron beam column” (column 6, lines 30-35)

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- x. An acceleration system ("JEOL Model 6400") providing a low acceleration voltage (column 9, lines 20-25)
- xi. A computer controller (50, column 4, lines 38-45; column 7, lines 33-44) adapted to control the electron delivery system
- xii. The gas delivery system (34; column 5, lines 22-38) is also adapted to "dispense a carrier gas towards said opaque defect" – Applicant's claim 18 limitation of "adapted to dispense a carrier gas towards said opaque defect" are intended use claim requirements. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).
- xiii. Applicant's claim 20 limitation of "the reactant gas absorbs to said opaque defect and becomes disassociated" are intended use claim requirements. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of

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performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Casey, Jr. et al (USPat. 6,042,738) in view of Fuji, Eiji et al (US 5,876,504 A). Casey is discussed above. Casey does not teach the angle of gas injection of Casey's gas delivery system (45, 34; column 5, lines 22-38) has an angular dispersion of 5-25°. Fuji teaches a variably positioned gas injection nozzle (8; Figure 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Casey's gas injector nozzle with Fuji's variably positioned gas injection nozzle (8; Figure 2).

Motivation to replace Casey's gas injector nozzle with Fuji's variably positioned gas injection nozzle (8; Figure 2) is for establishing laminar flow on the substrate as taught by Fuji (column 4, lines 35-40).

8. Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Casey, Jr. et al (USPat. 6,042,738) in view of Hashimoto, Hiroyuki (US 6,420,701 B1). Casey is discussed above. Casey does not teach operating pressures in 0.5-10.0mTorr, "a beam comprising a current

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of about 0.05-1.0nA”, electrons beams with diameters of about 5-125nm and energies of 0.-3.0keV.

Hashimoto teaches an electron beam apparatus (Figure 7) including operating pressures up to 100picoTorr (column 6, lines 15-20), beam currents of about 1.0nA (column 7, lines 1-10), electrons beams with diameters of about 5-125nm (“not more than 1 micrometer”; column 7, lines 1-10) and energies of 3.0keV (column 7, lines 23-31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Casey’s electron emitting column with Hashimoto’s electron emitting column (12; Figure 7).

Motivation to replace Casey’s electron emitting column with Hashimoto’s electron emitting column (12; Figure 7) is for thin film processing as taught by Hashimoto (column 6, lines 30-41).

Response to Arguments

9. Applicant's arguments with respect to claims 1-12, and 18-24 have been considered but are moot in view of the new grounds of rejection.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (703) 872-9306. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the

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examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (571)

272-1439.

Gregory L. Mills
6/14/4